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**RIMS Kôkyûroku Bessatsu B9**

# Higher Dimensional Algebraic Varieties and Vector Bundles

September, 2006

Research Institute for Mathematical Sciences  
Kyoto University

*RIMS Kôkyûroku Bessatsu B9*

*Higher Dimensional Algebraic Varieties  
and Vector Bundles*

*September, 2008*

*Research Institute for Mathematical Sciences*

*Kyoto University, Kyoto, Japan*

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## PREFACE

This volume of Kôkyûroku Bessatsu is the proceedings of the workshop **“Higher Dimensional Algebraic Varieties and Vector Bundles”** which was held at the Research Institute for Mathematical Sciences (RIMS) of Kyoto University during July 2–5, 2007. There were 19 lectures at the workshop and this volume collects 11 contributions from the speakers. As the editor I would like to thank the referees. Special thanks are due to Professor Eiichi Sato, who has organized similar workshops every four years.

Shigeru MUKAI

**This volume is respectfully dedicated to**

**Professor Masayoshi Nagata**

**who passed away in August 2008 at the age of 81.  
We owe him so much for his academic achievements  
and personal guidance.**

September 2008

Shigeru MUKAI

Eiichi SATO

# PROGRAM

RIMS Workshop on

## Higher Dimensional Algebraic Varieties and Vector Bundles

Organizer: Eiichi SATO (Kyushu Univ.)

Period: July 2 – July 5, 2007

Place: Research Institute for Mathematical Sciences, Kyoto University

### July 2, Monday

9:45–10:45 Osamu FUJINO (Nagoya Univ.)

Multiplication maps and vanishing theorems for toric varieties

11:00–12:00 Takeshi ABE (RIMS, Kyoto Univ.)

Bundles on a nodal curve

13:30–14:30 Mutsumi YOKOYAMA (Aichi Prefectural Matsudaira Senior High School)

Stability of cubic hypersurfaces of dimension 3 and 4

14:45–15:45 Yoichi MIYAOKA (Univ. of Tokyo)

Curves on surfaces of general type with  $K^2 > c_2$

16:00–17:00 Hiroyuki NAKAOKA (Univ. of Tokyo)

On the structure of certain algebras by means of the adjointness of Mackey functor

### July 3, Tuesday

9:45–10:45 Atsushi IKEDA (Osaka Univ.)

The varieties of intersections of lines and hypersurfaces in projective space

11:00–12:00 Yukinobu TODA (Univ. of Tokyo)

Moduli stacks and invariants of semistable objects on K3 surfaces

13:30–14:30 Atsushi TAKAHASHI (Osaka Univ.)

Triangulated categories of graded singularities associated to regular weight systems with  $\epsilon = -1$

- 14:45–15:45 Akira ISHII (Hiroshima Univ.)  
On the moduli of quiver representations associated with  
brane tilings (joint work with K. Ueda)
- 16:00–17:00 Kazuhiro KONNO (Osaka Univ.)  
Reducible curves on smooth surfaces

### July 4, Wednesday

- 9:45–10:45 Yoshiaki FUKUMA (Kochi Univ.)  
On the sectional geometric genus of multi-polarized  
manifolds and its application
- 11:00–12:00 Kiwamu WATANABE (Waseda Univ.)  
On homogeneous varieties as ample divisors
- 13:30–14:30 Tohru NAKASHIMA (Japan Women's Univ.)  
Existence of stable bundles on Calabi-Yau manifolds
- 14:45–15:45 Kimiko YAMADA (Sophia Univ.)  
Blowing-ups describing the polarization change of  
moduli schemes of semistable sheaves of general rank
- 16:00–17:00 Kōta YOSHIOKA (Kobe Univ.)  
Vector bundles on 2-dimensional complex tori

### July 5, Thursday

- 9:45–10:45 Daisuke MATSUSHITA (Hokkaido Univ.)  
On singular fibres of Lagrangian fibrations
- 11:00–12:00 Hirokazu NASU (RIMS, Kyoto Univ.)  
Deformations of degenerate curves on a del Pezzo 3-fold
- 13:30–14:30 Yoshio FUJIMOTO (Nara Medical Univ.)  
Endomorphisms of smooth projective 3-folds with  
nonnegative Kodaira dimension, II (joint work with  
N. Nakayama)
- 14:45–15:45 Noboru NAKAYAMA (RIMS, Kyoto Univ.)  
Building blocks of étale endomorphisms of complex  
projective manifolds (joint work with D.-Q. Zhang)

This research was partially supported by the Grant-in-Aid for Scientific Research (C) 19540037 (Eiichi Sato), Japan Society of Promotion of Science.

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